CLAIMS

1. A worked molybdenum-alloy material having high strength and high toughness, comprising at least one of carbide particles, oxide particles, and boride particles and fine nitride particles dispersed by internal nitriding of an untreated worked molybdenum-alloy material in which a nitride-forming-metal element is dissolved to form a solid solution in a molybdenum matrix and at least one of carbide particles, oxide particles, and boride particles is precipitated and dispersed.

2. The worked molybdenum-alloy material having high strength and high toughness according to Claim 1, wherein at least the surface region of the worked molybdenum-alloy material is composed of a worked structure or a recovered structure.

3. The worked molybdenum-alloy material having high strength and high toughness according to Claim 1, wherein a worked structure or a recovered structure is maintained through the entire worked molybdenum-alloy material.

4. The worked molybdenum-alloy material having high strength and high toughness according to Claim 1, wherein

the worked molybdenum-alloy material has a double-layer formation including a surface region maintaining a worked structure or a recovered structure and the inside of the worked molybdenum-alloy material, composed of a recrystallized structure.

5. A method for manufacturing a worked molybdenum-alloy material having high strength and high toughness according to any one of Claims 1 to 4, comprising the step of: subjecting an untreated worked alloy material, which has a matrix composed of molybdenum, in which at least one of carbide particles, oxide particles, and boride particles is precipitated and dispersed and in which at least one of titanium, zirconium, hafnium, vanadium, niobium, and tantalum is dissolved to form a solid solution, to multi-step internal nitriding treatment including a stepwise increase of the treatment temperature.